1.2 Chollas Creek Watershed Overview

This section presents an overview and characterization of the Chollas Creek Watershed. The successful application of BMPs in the Chollas Creek Watershed will depend on the TMDL constituents, the physical characteristics of the watershed, and the regulatory requirements. Therefore, understanding the watershed characteristics is important in the watershed activity selection process.

The Chollas Creek Watershed encompasses approximately 16,270 acres composed predominately of urbanized land located within the San Diego County (Figure 1-4). The drainage area to the northern fork of the watershed (9,276 acres) is larger than that to the southern fork (6,997 acres). The drainage area of the Chollas Creek Watershed originates in the cities of Lemon Grove and La Mesa. Chollas Creek flows through the City of San Diego and empties to the eastern shoreline of San Diego Bay. Though much of the creek has been channelized, there have been efforts to restore natural flow in the watershed (Figure 1-5 and Figure 1-6).

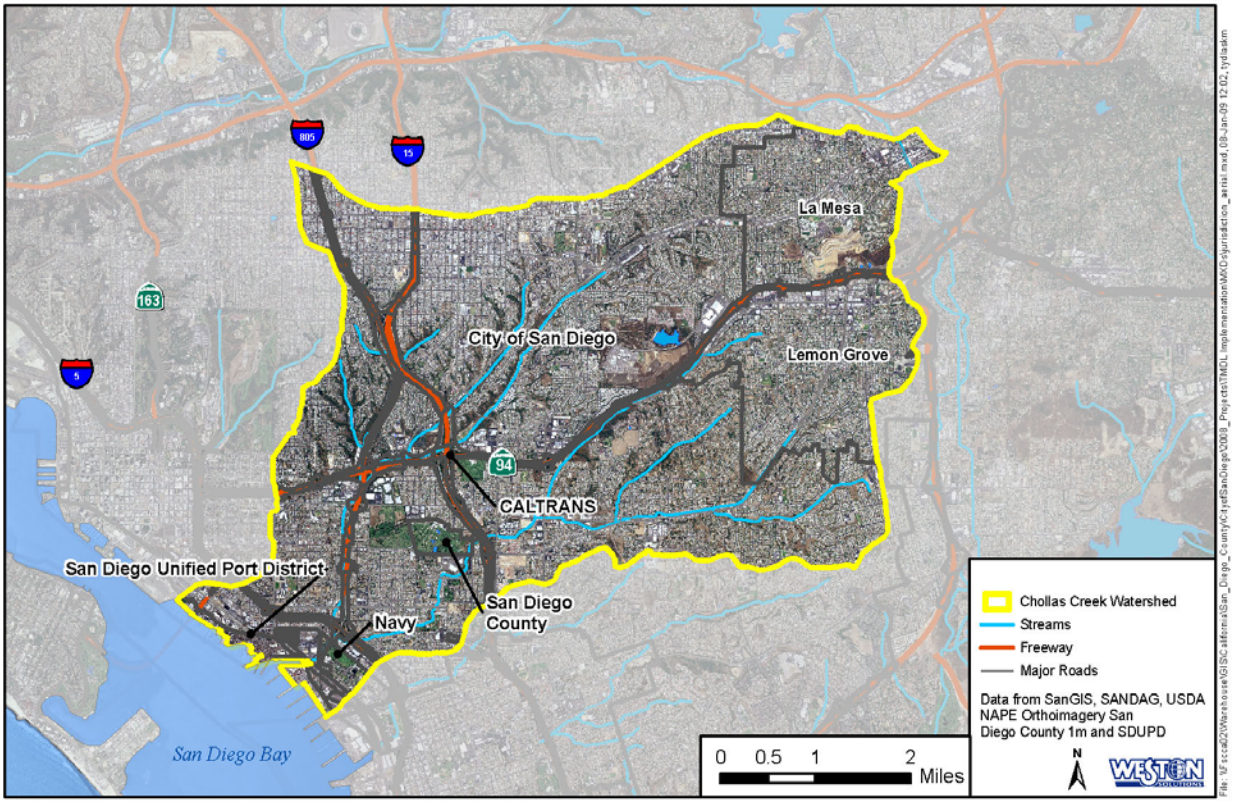

Figure 1-4. Aerial View of the Chollas Creek Watershed

Northern Branch of Chollas Creek at Hilltop Drive

Northern Branch of Chollas Creek at Site SD(8)

Figure 1-5. Channelization of the Chollas Creek Watershed

Overgrown Channel (pre-construction)

Natural Bottom Channel (post-construction)

Figure 1-6. South Bank of Chollas Creek (Station 5, Chollas Creek Enhancement Project, 2004-2007)

1.2.1 Land Use

The Chollas Creek Watershed is highly urbanized. Land use in the Chollas Creek Watershed is predominantly residential (48%) with some commercial (5%) and industrial use (2%), as shown on Figure 1-7. A significant portion of the remainder of the watershed consists of roads (22%), and freeways and highways (5%). The remaining land uses include open space, Discharger and public facilities, a cemetery, and other miscellaneous land uses.

Caltrans is responsible for the California State Highway System which possesses its own Municipal Separate Storm Sewer System (MS4) Permit (Order No. 99-06-DWQ, San Diego Regional Board, 2005). Portions of the Cities of San Diego, Lemon Grove, and La Mesa are also located within the watershed. The Port, the Navy and the County of San Diego hold jurisdiction over approximately one percent each of the Chollas Creek Watershed. A small portion of the watershed consists of "tidelands" immediately adjacent to San Diego Bay. Some of this tideland area is under the jurisdiction of the Port, while the remainder falls under the jurisdiction of the Navy. The apportionment of Chollas Creek Watershed by Discharger is presented in Table 1-1.

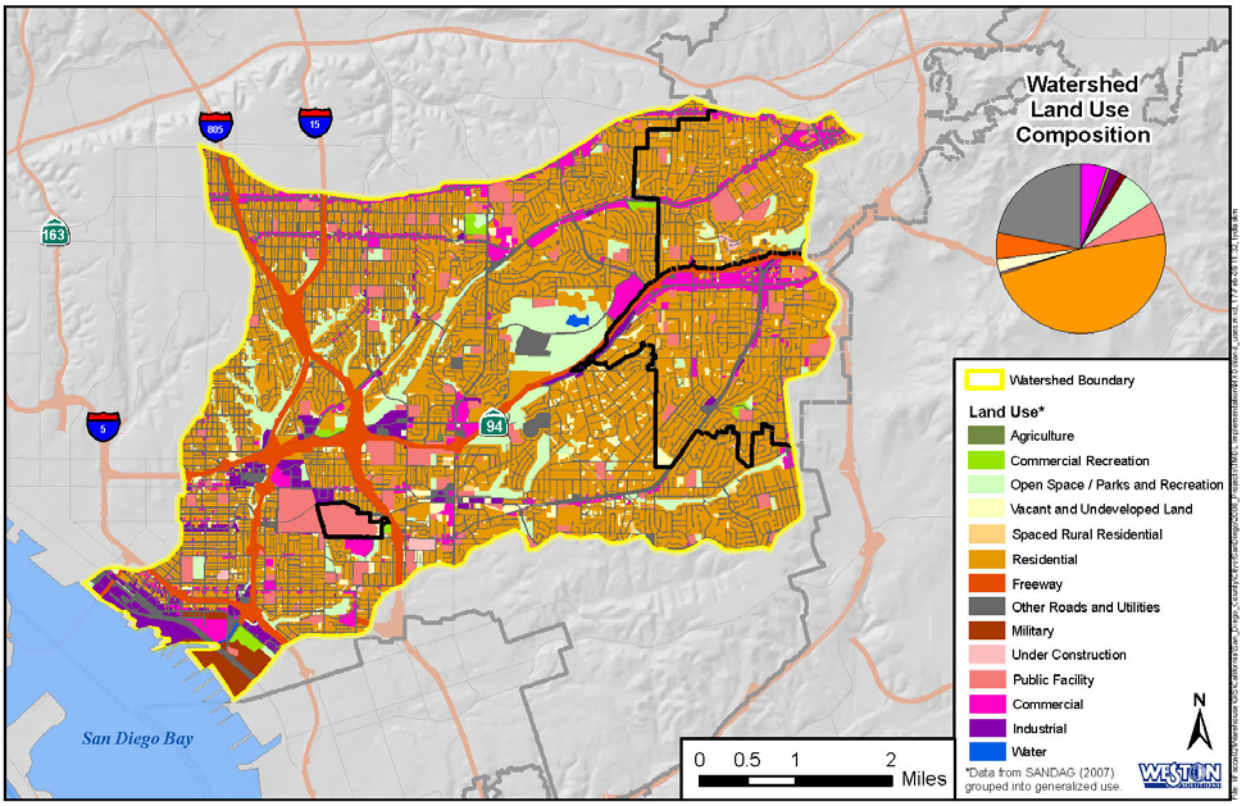

Figure 1-7. Chollas Creek Vicinity and Land Use Map

Table 1-1. Portion of the Chollas Creek Watershed Each Discharger has Jurisdiction

Discharger	Portion of the Chollas Creek Watershed
Caltrans	5%
City of San Diego	72%
City of Lemon Grove	12%
City of La Mesa	9%
County of San Diego	1%
Port of San Diego	1%
Navy	1%

1.2.2 Rainfall

Annual rainfall for the Chollas Creek Watershed averages 10.5 inches in coastal areas to 13.5 inches in the eastern portion of the watershed. Chollas Creek is a dry channel between storm events with intermittent flows of urban runoff. During rainfall events in the Chollas Creek Watershed flows respond in a relatively short time frame (i.e., within hours). Peak flows occur rapidly (short time of concentration) during the rainfall event and then return back to little or no flow, usually within two days. The Dissolved Metals TMDL technical report does not provide guidance on a "design" storm event for the current TMDLs. A recommended design storm is presented in Section 2.0 based on wet weather pollutograph studies by the City of San Diego and the Southern California Coastal Waters Research Project (SCCWRP).

1.2.3 Watershed Soils and Topography

The Chollas Creek Watershed is generally characterized by poorly draining soils and compacted urban lands based on United States Department of Agriculture Natural Resources Conservation Service surveys as shown on Figure 1-8. These characteristics limit the application of BMPs that require high permeability soils for redirecting runoff back into the ground through infiltration without the modification of existing soils. Site-specific investigations on the actual infiltration properties of the soils and citing constraints have been completed by the City of San Diego as part of the concept design of several low impact development (LID) infiltration BMPs. The results of these geotechnical investigations indicated that soils within the upper 10–20 feet of the surface in the mesa areas generally have a very low permeability whereas soils along the creek were found to have higher permeability. The existing soils found in the mesa tops of the Chollas Creek Watershed may make opportunities for infiltration of storm water cost prohibitive in some cases due to the necessity to incorporate additional engineering components, as described in Section 3.0.

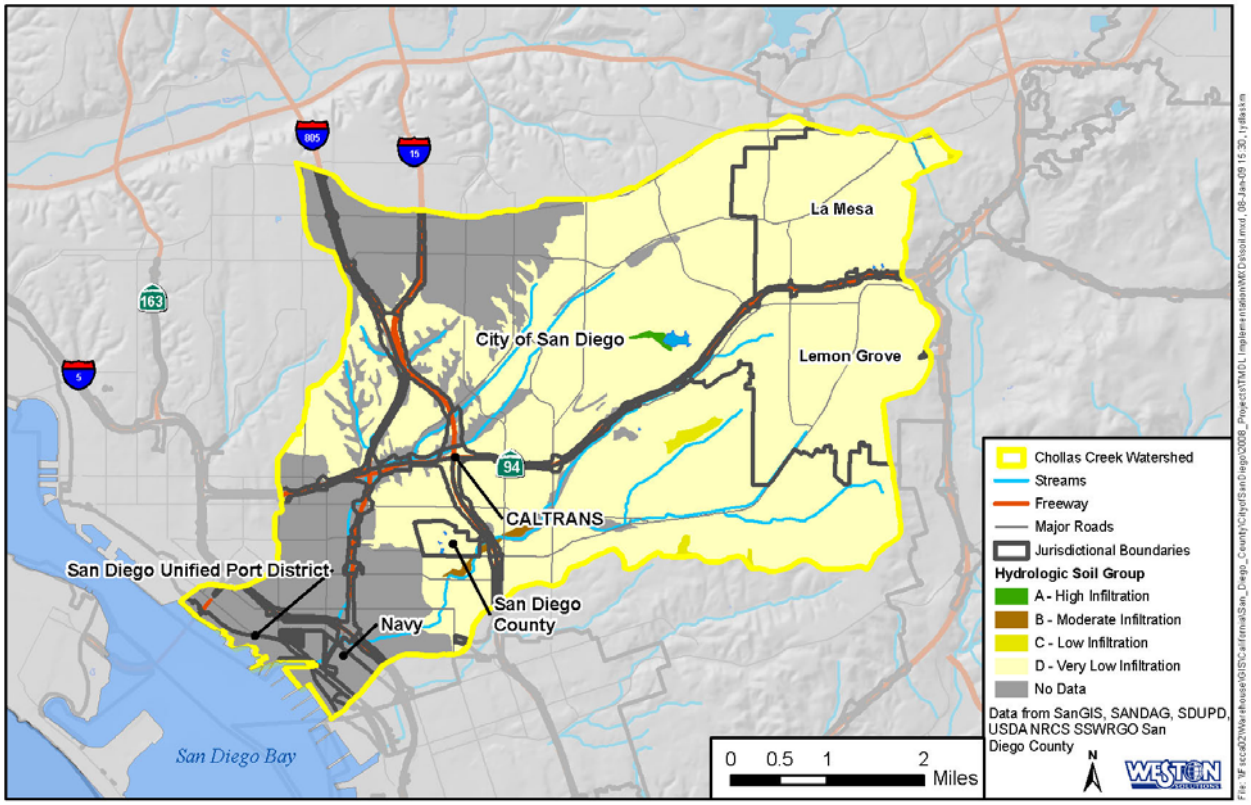

Figure 1-8. Chollas Creek Watershed Soil Permeability

As shown on Figure 1-9, the topography of the watershed is characterized by generally built-out urbanized mesas that drain to open canyons. The heavy urbanization of the mesas has altered flow characteristics to these canyons through the significant increase in impervious surfaces. These conditions have increased both the volume and velocity of storm water flows, and in addition, have limited the opportunities for storage and retention of these flows in the mesas. The canyon areas are characterized by steep side slopes where many of the MS4 outfalls are located. Due to development on the mesas and aging storm drain systems, increased peak flows into these

canyon areas have resulted in erosion of earthen channels and potential impact to the habitat and existing infrastructure (Figure 1-10). Freeway infrastructure which passes directly through the Chollas Creek Watershed also presents significant stretches of impervious surfaces. When considering the density of the existing development, watershed topography, and low-infiltrating soils in combination, Dischargers were presented with a challenge when identifying opportunities for implementation of structural treatment BMPs on the built-out mesas, as described in Section 3.0.

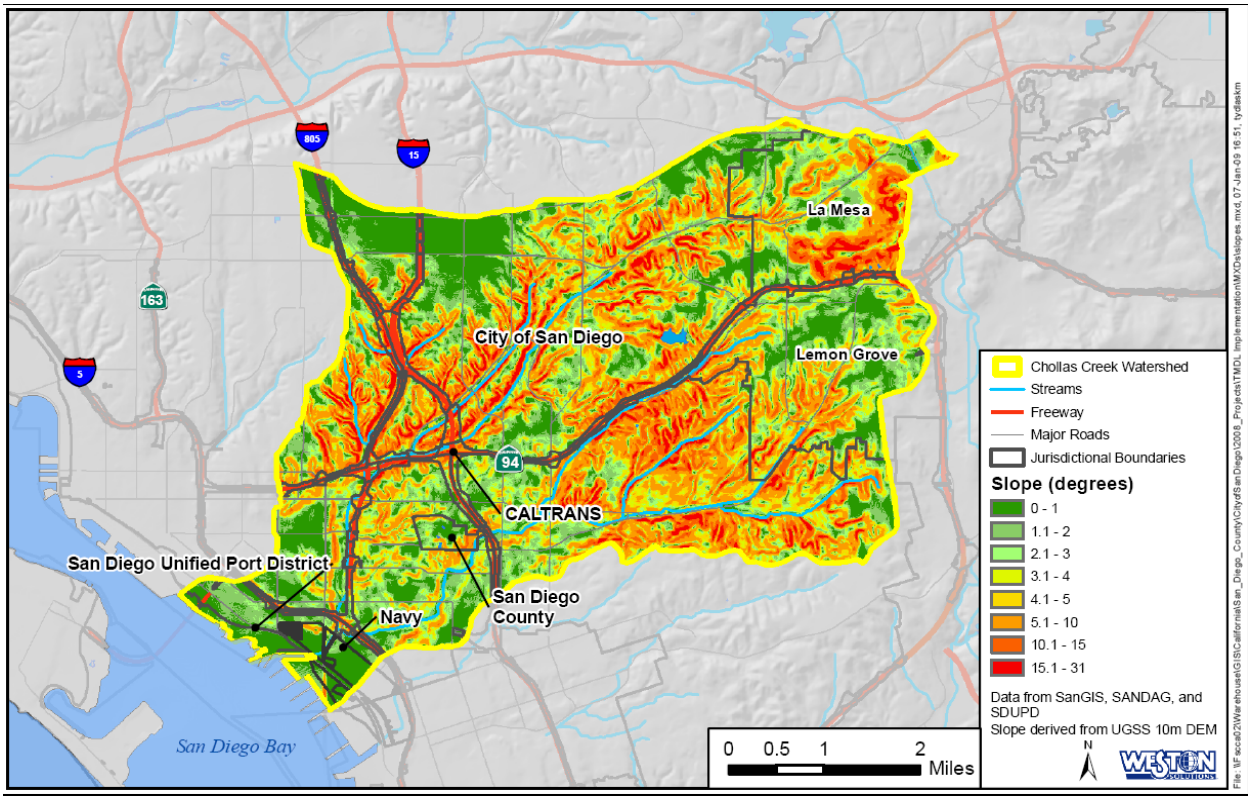

Figure 1-9. Chollas Creek Watershed Slopes

Extensive Erosion of Natural Channels due to Increased and Sustained Peak Flows from Surrounding Developed Mesas – Manzanita Canyon

Erosion of Canyon Side Slopes Below MS4 Outfall with Potential Impact to Existing Infrastructure and Canyon Habitat – 32nd Street Canyon

Figure 1-10. Erosion in the Chollas Creek Watershed

1.2.4 Chollas Creek Modifications and Channelization

Over the past 68 years, Chollas Creek has been modified, diverted, or channelized in several locations, primarily for flood control purposes. Much of the creek has been channelized and concrete lined. Approximately 30 percent of the creek was channelized prior to the November 28th, 1975 adoption of the Basin Plan as illustrated on Figure 1-11. The most significant alteration is evident in north fork of Chollas Creek in the 1949, the large scale channel change plans depicted in yellow. Depicted in green is the concrete channelization that has occurred over the past 68 years over a significant portion of the Chollas Creek Watershed. Also shown, are channel re-alignments, slope lining, and box culverts that have been installed. These channel modifications were identified as waters of the United States when beneficial uses were first designated in 1975. Currently, the designated beneficial uses of all streams in the Chollas Creek Watershed (Hydrologic Unit No. 8.22) are identified in the Basin Plan as Non-Contact Water Recreation (REC-2), Warm Freshwater Habitat (WARM), and Wildlife Habitat (WILD). Contact Water Recreation (REC-1) is a potential beneficial use.

Chollas Creek Modifications and Channelization 1938-1970

Prior to the Clean Water Act of 1972, many modifications were made to Chollas Creek. This map highlights some of those changes, especially those involving concrete channelization. The text boxes provide the year, a description, and the location of change.

This map depicts only a portion of alterations made to Chollas Creek between 1938-1970, and should not be considered a full representation of all channelization or modification.

Legend

Chollas Creek

CHANNEL

CULVERT

Rose text boxes generally refer to box culverts.

Orange text box refers to a section of channel near Wabash and Main that is unlined, except for some slope lining.

Yellow text boxes generally refer to large scale channel change plans from1949.

Green Text boxes generally refer to lined channels.

Purple text boxes generally refer to channel re-alignments.

Mauve text boxes generally refer to locations under bridges or at intersections.

Prepared by the City of San Diego
Metropolitan Wastewater Department
Storm Water Program

Map Not To Scale

N

1960-Plans indicate creek is channelized here.
1958- double box culvert.
1959- Plans show PCC channel along Auburn between Corliss and Loris.
1960-Plans show a rip-rap lined channel.
1956-Double box culvert between 60th and College.
1956- Plans show a PCC channel along Home Ave at Fairmount.
1956- Shows a double box culvert west of 60th.
1956-Box culvert under Spillman Rd, changes to open channel.
1956- Chollas Road & Chollas Creek Improvement plans show a double box culvert.
1956- PCC lined channel.
1960- Plans show a double box culvert opening to an open channel and rip-rap.
1957- Shows (unlined?) ditch and a 48", 450' RCP. Creek underground?
1953- Shows lined channel, rip-rap/gunite at Euclid.
1949- Plans for channel changes in Wabash Canyon, from Landis to Main.
1965- PCC lined ditch/channel along Chollas Parkway, NE of Fairmount. Distance unknown.
1949- Wabash Canyon Creek channel change plans show cross-section of channel at the Wabash and Federal interchange.
1965-Shows existing channel.
1954-Concrete channel shown from Market St extending to I-15.
1970-PCC lined channel
1966- Lined Channel between Lenox and Geneva along Elwood.
1952- J St Bridge over Las Chollas Creek Channel. Plans to excavate flood control channel.
1947- PCC Culvert under 60th St.
1953- Plans show concrete channel from "stations 10-64"- or from approximately Newton to Market Sts.
1964- Plans show typical section of lined channel from Hilltop to Guymon.
1952- plans show the Las Chollas Creek Flood Control Channel at the Ocean View Blvd bridge. Appears cemented.
1959- Plans show a concrete lined ditch betweeen Jamacha and Jacmar.
1964- Plans show a lined channel near Market and Euclid.
1962- Shows cross-section of possible PCC lined channel from6
In 1938, the Chollas Creek Alignment project plans for the relocation of the creek from its original course, aligning it with Wabash Blvd, now the I-15.
1958- Unlined ditch at 54th and Market.
1945- The channel under the National Ave Bridge is shown to have rip-rap sides.
1951-Plan for PCC culvert at 62nd St north of Akins, draining to PCC lined creek.
1960- Plans for 6' cement treated channel.
1970- Lined channel between 54th and Pitta along Imperial.
1946- Plans indicate channel changes near 33rd St from Greely to Boston
-1961- Plans show a double box culvert under Imperial Ave.
1948- Realignment of Imperial Ave between 55th and Merlin. Imperial used to follow Chollas Creek. Both Imperial Ave and Chollas Creek were moved north.
1953- Plans show channel from "stations 6-10" or approximately Newton to 32nd St.
1953- Rough concrete slope noted at Wabash and Main
1959- Plans show PCC lined channel on south branch from Wabash to 40th St.

Figure 1-11. Chollas Creek Modifications and Channelization from 1938–1970